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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/593,347

01/10/2008

Makoto Sakata

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EXAMINER

CHAWLA, JYOTI

ART UNIT

PAPER NUMBER

1781

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/593,347	Applicant(s) SAKATA ET AL.	
	Examiner JYOTI CHAWLA	Art Unit 1781	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2012.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
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| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/1/2011</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/4/2012 has been entered as compliant. No claim amendments have been presented and claims of 1/10/2008, 1-8 and 10-15 are examined in the current application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not

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commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

A) Claims 1 and 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over IDS reference to Hayashi (JP 2003321502 abstract and official translation submitted 12/28/2006), in view of the combination of Industrial Gums by Roy whistler (Pages 197-263), hereinafter Whistler, IDS reference to Hideo Nakahama (JP 02049001 abstract and official translation), hereinafter Hideo and Musher (US2131064), hereinafter Musher.

Regarding claims 1 and 4, 7-8 Hayashi teaches a method for enhancing the emulsification ability of gum arabic comprising a step of making unheated gum arabic into an aqueous dispersion and a step of maintaining the thus-obtained aqueous solution to 30 °C or higher (Abstract and paragraphs 6, 9-15 of translation), which overlaps with applicant's claimed temperature treatment of below 60°C (for claims 1 and 7) and 5-40 °C (claim 4), and 10 to 50 °C (claim 8). Hayashi also discloses that treatment of gum arabic enhances the emulsification properties (See Paragraphs 26-28 on pages 6-7 of official translation). Hayashi translation discloses heating from 30-59 °C, which overlaps the claimed temperature range but does not cover the entire range of temperature as claimed, however, solubility of gum arabic in cold water was well known in the art at the time of the invention. For example, Whistler on page 216 discloses that gum arabic is extremely soluble in water and can form solutions over a wide range of concentrations (Figure 4, page 216), solutions of up to 37% gum arabic can be achieved at room temperature and the increasing the temperature increases the solubility of gum arabic in aqueous solutions (Pages 217-219). Musher teaches that water soluble gums, such as, gum arabic, to produce a composition without heating (Page 2, Column 1, lines 32-36). Thus, making solutions comprising gum arabic wherein the aqueous medium is in recited temperature range was known, as disclosed by Musher and Hayashi. Further, emulsions made with gum arabic without application

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of heat were also known. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that gum arabic makes stable emulsions after low temperature treatment, as well as without any heat treatment (Hayashi, Whistler and Musher). Regarding the overlapping of ranges between the invention and prior art composition it is noted that in the case where the claimed ranges "overlap or lie inside the ranges disclosed by the prior art" a prima facie case of obviousness exists (In re Wetheim, 541 F2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990)).

Hayashi teaches heat treatment of gum arabic in the temperature range 30-59 °C enhances the emulsification property of gum arabic (see official translation Par 6, 9-15 and 36-28), however, Hayashi is silent regarding the limitation of making an aqueous solution of gum arabic with a pH of 4.5 to 6. However, gum arabic has been known to be used as an emulsifier (Hideo) and one of ordinary skill had the knowledge about the typical treatments solubility and viscosity properties of gum arabic at the time of the invention. For example, Whistler discloses that gum arabic solutions exhibit maximum viscosity in the pH range of 4.58 to 6.3 (Page 223-225, section under pH) wherein the polymer chain is in an extended state, and this increase in viscosity in turn will increase the emulsification ability (as disclosed by Hideo, Official translation, Page 2, last 4 lines). Since the applied reference to Whistler clearly discloses increased viscosity of gum arabic solution under acidic pH of 4.58 to 6.3 (which overlaps the claimed pH range as claimed), which increases the emulsification property of gum arabic, therefore, it would have been a matter of routine determination for one of ordinary skill in the art at the time of the invention to modify Hayashi and treat gum arabic with temperatures under 60 °C in an acidic aqueous solution wherein the pH of the solution is in the range of 4.5 to 6 as taught by Whistler. One of ordinary skill in the art at the time of the invention would have been motivated to treat gum arabic under acidic conditions at least for the known benefit of enhancing the viscosity of gum arabic solution which in turn will enhance the emulsification property of gum arabic as claimed.

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Further, heat and acid treatment of gum arabic solutions were well known for their separate benefits of enhancing viscosity i.e., emulsifying quality of gum arabic in solution, the idea of combining them flows logically from their having been individually taught in prior art, i.e., combining the two treatment steps for the same purpose of enhancing the emulsification ability of gum arabic solution would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined two known method steps with the expectation that such a combination would be also be effective in creating gum arabic having enhanced emulsification properties. Thus, combining the method steps flows logically from their having been individually taught in prior art.

Regarding the heat treatment time aqueous solution is maintained at below 60°C of at least 6 hours (claim 5) and the time for which the aqueous solution is maintained at below 60 °C is at least 3 hours (Claim 6), Hayashi translation, paragraphs 9-15 discloses the claimed limitation of soaking for up to 30 days.

B) Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi, Whistler Hideo, and Musher further in view of IDS reference to Lee et al (EP 0108594), hereinafter Lee.

Hayashi, in view of the combination of Whistler, Hideo and Musher has been applied to 1, 4-8 above.

Regarding the amount of gum arabic in an emulsion as recited in claims 2-3, Hayashi official translation discloses that water content of gum arabic is 3-30%, but the reference does not disclose the concentration of gum arabic in aqueous gum arabic solution as claimed. Whistler discloses that gum arabic is extremely soluble in water and can be dissolved in amounts up to 37% at room temperature (Whistler, Page 216-217, entire section under Viscosity and Table 4) and soluble up to 50% (Table on page 217). Whistler also discloses that the solubility of gum arabic in water increases as the temperature of water increases (See Page 227, last Para and Pages 217-221). Further,

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Lee teaches of emulsions with 10-30% gum arabic (Page 6, lines 23-25). Therefore, since emulsions were known to comprise gum arabic in the range of 10-30% of the composition, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Hayashi and utilize aqueous solutions of gum arabic having desired amount of gum arabic concentrations to make the enhanced emulsification gum arabic product. One would have been motivated to make an aqueous solution of gum arabic with concentration of gum arabic in the claimed range of less than 50% (claim 2) and 10-30 mass% (claim 3) at least for the purpose of achieving a modified gum arabic solution having increased emulsification property in concentration that is optimal for incorporation in emulsions.

Response to Arguments

Applicant's arguments filed 12/6/2011 with after final have been fully considered but are moot in view of new grounds of rejection necessitated by applicant's amendment of independent claim and cancellation of claims 9-16. The new arguments do not apply to any of the references being used in the current rejection.

Applicant argues that (JP 2003321502) to Hayashi is not applicable as official translation of Hayashi is relied upon in the rejection above which clarifies a lot of arguments regarding method steps. Regarding the argument that Hayashi teaches a paste and not an aqueous solution (Remarks of 12/6/2012)

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In the instant case Hayashi is employed in combination with Whistler, Musher, and Hideo (as applied to claims 1, 4-8) and further in view of Lee (Claims 2-3). Hayashi teaches a method for enhancing the emulsification ability of gum arabic comprising a step of

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making unheated gum arabic with water and a step of maintaining the thus-obtained aqueous solution to 30°C or higher (Abstract and paragraph 6 of translation), which overlaps with applicant's claimed temperature treatment of below 60°C (for claims 1 and 7) and 5-40 °C (claim 4), and 10 to 50 °C (claim 8). Whistler and Musher have been relied upon to show that that water soluble gums, such as, gum arabic, produce an aqueous dispersion or solution without heating (Page 2, Column 1, lines 32-36) and Whistler has been also relied upon to show the conventionality of aqueous solutions comprising up to 50% of gum arabic solution were known and up to 37% gum arabic solution can be obtained with ease at room temperature (Pages 216-217, Whistler) and that the solubility of gum arabic in water is increased by increasing the water temperature (Pages 219-220, Whistler). Thus, gum arabic solutions having concentration of gum overlapping the claimed range was known and treatment of gum arabic in the recited temperature range was known, as disclosed by Hayashi, Musher, and Whistler. Further, emulsions made with gum arabic without application of heat were also known. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that gum arabic makes stable emulsions after low temperature treatment, as well as without any heat treatment (Hayashi, Whistler and Musher).

Regarding the amount of water, Hayashi adjusts the moisture of gum arabic to an extent, but Whistler as applied above responds to applicant's remarks. Further, Lee (EP 0108594) has been relied upon to show the conventionality of utilizing gum arabic in claimed range as Lee teaches of emulsions with 10-30% gum arabic (Page6, lines 23-25), (see rejection of claims 2-3 for details of response to applicant's argument regarding references not teaching water content).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JYOTI CHAWLA whose telephone number is (571)272-8212. The examiner can normally be reached on 9:00 am to 5:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lawrence Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JYOTI CHAWLA/

Primary Examiner, Art Unit 1781